

ASTROPHYSICS AND GEOPHYSICS

MULTICOLOR MICROVARIABILITY OBSERVATIONS OF BL LAC OBJECTS: 1ES 1959+650 AND OJ 287

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Active galactic nuclei (AGN) are some of the most energetic objects in the Universe. They are composed of an ordinary elliptical galaxy with a super massive black hole at the center. A disk of material, called an accretion disk, surrounds the super massive black hole, and jets of material moving at nearly relativistic speeds are emitted perpendicular to the disk. In the BL Lacertae class of AGN jets are pointed almost directly along the line of sight, resulting in large amplitude, erratic brightness variations. Our primary goal is the monitoring of the brightness variations of BL Lac objects and using these variations to investigate the physics at work in these objects. We have undertaken a program to monitor these continuum variations on very short time scales, which last only a few hours and are known as microvariability. Microvariability represents the most rapid variations seen in these objects and thus set the tightest constraint possible on the size of the emission region and light travel time arguments. Using the Bell Observatory 0.6m telescope, observations were obtained of 1ES 1959+650 and OJ 287 in the V and I filters. Using the two filters, limits were set to the size of the emission regions responsible for any observed microvariability and we hoped to test the models of jet physics and of the origin of the seed photons responsible for the observed gamma-ray emissions.